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(54) Patient warming or cooling blanket

Patienten-wärmende oder-kühlende Decke

Couverture pour chauffer ou refroidir un patient

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DE-U- 8 234 528 **US-A- 2 601 189**

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Description

Medical care providers have long recognized the need to provide warmth and cooling directly to patients as part of their treatment and therapy. The relatively recent proliferation of mobile emergency medical facilities as an adjunct to fire departments and the expansion of clinical facility services in the community has increased the number of sites where such treatments must be given. Consequently, there has evolved a need for an inexpensive disposable patient thermal control blanket which will provide a distributed air flow while maintaining sufficient pressure in the blanket to prevent blockage of the flow due to the blanket folding or crimping.

The present application relates to a patient warming or cooling blanket which employs a bath of temperature controlled air applied to the patient rather than utilizing direct or indirect contact with a heat exchanger.

Devices of the type described above are well known in the art, for example U.S. Patent No. 2,093,834 discloses of a mechanism for providing localized air conditioning by means of an inflatable covering constructed of plurality of tubular enclosures of porous material in conjunction with a quilted covering. Devices of this construction rely on a recirculating cooling or heating medium and transfer heat mainly through contact with the blanket surfaces. This patented device as well as those of U.S. Patents Nos. 2,601,189 and 4,572,188 which are also of such essentially tubular or corrugated construction have the disadvantage that they are longitudinally rigid, relatively uncomfortable, have a high profile, and due to the complexity of devices of this type, they are relatively expensive to construct. Patent 2,093,834 shows a construction which is susceptible to tube wall compression which constricts the flow path and increases internal pressure resulting in flow restriction and rigidity due to the entrapment of air within the device. The construction of the devices of U.S. Patents Nos. 2,601,189 and 4,572,188 include lateral passages to adjacent tubes which do not fully alleviate the tube compression flow restriction problem and are more expensive to fabricate than the instant invention by virtue of their complex construction.

EP-0,311,336 which forms the basis for the preamble of claim 1 discloses a blanket, comprising a plurality of communicating inflatable chambers, similar to that of US 4,572,188.

In view of the foregoing shortcomings in pneumatic temperature control patient blanket fabrication, the present invention provides a pneumatic, temperature control blanket receiving conditioned air through an external air supply connection means, comprising, in combination, an upper flexible sheet and a lower flexible sheet each having a first end, an opposing second end and edges defining a periphery, said first end lower flexible sheet being adjacent said first end upper flexible sheet, a peripheral bonding means bonding said upper flexible sheet periphery to said lower flexible sheet

periphery, a pneumatic flow chamber defined by said sheets having walls, an inlet air port defined in said pneumatic flow chamber, an inlet air connection means affixed to said sheets in communication with said inlet air port adapted to receive the inlet air supply connection means to inflate said pneumatic flow chamber, an outer fibrous bottom lamina material bonded to said lower flexible sheet thereby comprising a laminated assembly to provide a slide resistant comfortable patient contact surface, an outwardly disposed air flow orifice array defined in said laminated assembly in communication with said pneumatic flow chamber to convey temperature controlled air from said pneumatic flow chamber to the patient, said orifice array comprising a plurality of openings sized to maintain pneumatic flow chamber pressure over a range of air source volume flow rates, characterized in that said blanket is disposable and in that said inlet connection means comprises an articulating fitting plate having a folded mode and an unfolded inflation mode, an opening defined in said fitting plate in communication with said port adapted to sealingly receive the air supply connection means when said plate is in said unfolded mode, said fitting plate being attached to said upper flexible sheet first end and said lower flexible sheet first end, said inlet air port and fitting plate being located intermediate said upper and lower flexible sheets at said sheet's edges to permit the introduction of supply air in said chamber in the direction of the plane of the blanket minimizing flow restrictions.

According to another aspect of the invention there is provided a pneumatic temperature control blanket for receiving conditioned air through an external air supply nozzle, comprising, in combination, a substantially planar chamber having a flexible upper wall, a flexible lower wall and an edge, a port communicating with said chamber defined in said edge, characterized in that said blanket is disposable and in that said blanket further comprises a folding fitting plate affixed to said upper and lower walls having a central opening in communication with said port, said fitting plate having a fold line in alignment with said chamber edge, said fitting plate central opening adapted to slidingly, sealingly receive the air supply nozzle in the blanket plane upon said plate being unfolded, an orifice array defined in said lower chamber wall, said orifices being in communication with said chamber outwardly disposed to discharge chamber air onto the patient.

The present invention advantageously provides a disposable blanket for use in patient warming and cooling applications which is simple to operate, easy to construct, economical to manufacture and concisely storable.

The invention may beneficially provide a pneumatic blanket which employs materials and structural elements which are comfortable to the patient with whom they contact.

The invention preferably enables the pneumatic patient blanket to provide an even, pleasant and healthy

flow of air uniformly over the covered area regardless of where the blanket air chamber may be compressed.

The invention pertains to disposable heating and cooling patient blankets. An external air conditioning unit provides low pressure heated or dehumidified and cooled air through a flexible hose having a supply nozzle. Conditioned air is introduced into the blanket pneumatic chamber by means of the supply nozzle which inserts into an inlet port through a low-cost folding cardboard fitting plate mounted on the edge of the blanket.

The folding cardboard fitting plate has a folded storage mode to permit the blanket to be folded into a compact mass for storage. In its open operative mode the fitting plate is essentially planar having an opening which is sized to snugly receive the supply nozzle horizontally through the blanket edge directly into a pneumatic flow chamber thereby avoiding opposite wall obstructions of the supply nozzle airflow.

The pneumatic flow chamber is constructed of, and defined by, the interface of two polyethylene sheets heat bonded together at their perimeters and at a plurality of staking points in a single step of the assembly process. Air flow through the blanket is enhanced by the creation of fully redundant flow paths around the staggered dot staking pattern which is distributed throughout the blanket area. A layer of non-woven wood pulp airlaid material is adhesively bonded to the bottom sheet of polypropylene thereby forming a laminated layer and both the bottom sheet of polyethylene and airlaid material are perforated by an array of selectively sized orifices. The orifices are distributed in a regular pattern throughout the area bounded by the pneumatic chamber parameter and allow the emission of an even, gentle air stream from the blanket bottom and are of such size that the blanket will be pressurized enough to hold its shape and resist crimping of the air flow due to normal compressive forces being applied to the blanket. The airlaid material rests comfortably against the patient bathing the patient in the air emitted from the orifices and helps keep the blanket from sliding off the patient because of its high frictional characteristics.

In order that the invention may be clearly understood, it will now be described, by way of example, with reference to the accompanying drawings, wherein:

- FIG. 1 is a plan view of the patient blanket in accord with the invention,
 FIG. 2 is an enlarged, cross-sectional, detail elevation view of the blanket showing the pneumatic chamber between staking points as well as the relationship of the several blanket layers in accord with the invention,
 FIG. 3 is an elevational view of the folding cardboard fitting plate in accord with the invention shown in the open or unfolded mode,
 FIG. 4 is an enlarged, elevational, detail sectional view of the folding cardboard fitting plate air inlet connection with an external air supply

nozzle inserted therein in accord with the invention, and

- FIG. 5 is an enlarged, elevational, detail view of the cardboard fitting plate as attached to the blanket in accord with the invention and shown in the folded storage condition.

In the invention, a three layer construction is employed to form the patient blanket 10 with two layers forming an air chamber and a third layer providing a comfortable surface for contact with the patient. It will be obvious to a person familiar in the art, that any of a number of flexible sheeting materials can be used for the upper flexible sheet 12 and lower flexible sheet 14, but in the preferred embodiment for economy, strength and flexibility considerations 38.1 μm (1.5 mil) thickness polyethylene sheeting was selected. Simple, economical assembly of the blanket begins when the 0.381mm (.015 inch) thick layer of non-woven fibrous layer of wood pulp airlaid material 16 is adhesively bonded to the lower side of the 38.1 μm (1.5 mil) thickness lower flexible sheet 14 forming the laminate assembly 18, as shown in FIG. 2. This fibrous layer 16 provides a comfortable surface in contact with the patient and its high frictional characteristic helps keep the blanket in place on the patient. A material of this type is available under the trademark "AIRTEX" from the Fiberware Corporation. The laminate assembly 18 is then perforated with specifically sized orifice holes 20 by means of a punch plate. The orifice size is determined by the volume flow characteristics of the air source and by the following formula:

$$Q = KA P$$

Where Q is the air flow rate in $4.72 \times 10^{-4} \text{ m}^3 \cdot \text{s}^{-1}$ (cubic feet per minute), K is a constant, A is the area of the orifices and P is the differential pressure in 249 Pa (inches of water) at standard room conditions. From test results it was determined that for proper flow and inflation K should be 11.718; A should equal 0.645 mm^2 (.001 square inches) for each 645 mm^2 (square inch) of blanket which will produce 0.889mm (.035 inch) diameter orifices on 25.4mm (1 inch) centres and P is 62.3 Pa (.25 inches of water).

The sizing of the orifices 20 by this method assures sufficient inflation to minimize crimping of the blanket while providing continuous air flow to the lower surface 22 that is both evenly distributed and above the minimum flow quantity required. The problems associated with compressing or crimping the blanket are also alleviated through the invention's incorporation of a multiplicity of redundant flow paths as shown by the arrows 24 within the pneumatic flow chambers 26 as shown in FIG. 1 due to the inflation of the blanket.

Subsequent to the lower layer lamination and orifice perforation, the upper flexible sheet 12 is laid upon the laminated assembly 18 and the periphery 28 of the two polyethylene layers are heat sealed together. In the same process step, the two flexible sheets are also

staked together in a staggered pattern of 25.4mm (one inch) diameter heat sealed staking bonds or welds 30 throughout the area within the periphery seal. This staking creates the redundant flow paths 24 feature of the invention as well as serving the dual purposes of reducing stresses to the inflated structure through reducing the radius of the chambers 26, and through the same mechanism reducing the blanket inflated thickness while assuring flow distribution and continuity across the lower surface 22 of the blanket.

The preferred air inlet location is through a fitting plate on the blanket edge 32 intermediate the upper flexible sheet first end 34 and the lower flexible sheet first end 36. In this blanket edge center, a semicircular cut is made through the laminated assembly 18 and the upper flexible sheet 12. When the blanket is inflated, these semicircular cuts form an essentially horizontal circular air inlet port 42. By horizontal insertion of an air supply nozzle through the fitting plate into the blanket air flow is unrestricted by blanket film members pressing against the nozzle opening, and furthermore, there is no need to support the nozzle's weight. The conditioned air is introduced through a flexible hose 44 having a frustoconical end nozzle 38 converging towards the nozzle end 40.

The fitting plate 46, in accord with the invention, is best shown in FIGS. 3, 4 and 5. The plate 46 is fabricated of a low cost, foldable material with an exterior surface suitable for direct labeling. In the preferred embodiment, cardboard was selected as meeting the aforementioned criteria as well as being an inexpensive and easy to print material. The fitting plate 46 is an elongated member having a first end 48 and a second end 50 each with an extension and having a circular central portion 52 intermediate the ends. The circular center portion 52 defines an opening 54 which aligns with the blanket chamber port 42 to snugly receive the frustoconical air supply nozzle 38, thereby introducing conditioned air into the pneumatic flow chambers 26 when the fitting plate 46 is opened to its unfolded planar operative configuration as best seen in FIGS. 3 and 4. This open configuration provides full open area flow into the pneumatic flow chambers 26 through the port 42 and provides for easy nozzle 38 insertion into the blanket 10 edge 32.

As seen in FIG. 3, the fitting plate 46 preferably contains explanatory labeling to assist the user in the proper use of the invention and provides for simultaneous labeling of the blanket upper and bottom surfaces without additional labels. The plate first end extension 56 and second end extension 58 are labeled with the words "INLET" to mark the port 42 location into which the conditioned supply air is introduced. On the circular center portion 52, the plate first end 48 to which the upper sheet 12 is attached is identified by the words "THIS SIDE UP", and the plate second end 50 to which the blanket lower surface 22 is attached is identified by the words "THIS SIDE DOWN". Intermediate the plate first end 48 and second end 50 on the center portion 52 is a fold line 60 identified by dashed lines across the fitting plate central

portion 52. This fold line is aligned with the blanket edge 32 when the fitting plate 46 is installed on the blanket 10.

Semicircular cuts are made in the blanket upper sheet and lower sheet first ends 34 as seen in FIG. 1, which define the blanket chamber port 42 at which the fitting plate 46 is mounted as in FIG. 1. The plate 46 is aligned with the upper sheet 12 and the laminated assembly 18 and installed in line with the blanket edge 32 forming a hinge-like relationship with the blanket edge 32 as seen in FIG. 5. Because the adhesive is applied only to the plate center portion 52 inner side 62, forming a bond 64, the end extensions are free of the blanket surfaces. By remaining free, the inflated blanket profile and stress to the adhesive bond 64 during inflation are minimized; and the plate first end extension 56 and the plate second end extension 58 may be grasped and separated during nozzle insertion. As shown in FIG. 5, the fitting plate 46 provides concise packaging because it compactly folds along the plate fold line 60 providing a low profile; this configuration has the further advantage of reducing the stress to the interface bond 64 during storage and packaging.

The external conditioned air supply, not shown, can be a separate heating or cooling/dehumidification unit or a unified system and forms no part of the invention. The air supplies are typically transportable low pressure units, similar to a hair dryer construction or the like, having a moderate volume flow rate for which the orifices 20 are sized. The air supply is connected to the blanket by means of the flexible hose 44 as described below.

The pneumatic blanket 10 is typically used to adjust or maintain patient body temperatures through the application of either warming or cooling air for surgical, post operative, hypothermic or hyperthermic patients. In use, pneumatic blanket 10 is fully opened and positioned to cover the body area to be treated; if the whole body is to be covered, then the blanket is positioned lengthwise over the patient with the fitting plate 46 adjacent the patient's feet. Next, the fitting plate 46, which has been folded during storage, is grasped with appropriate fingers behind the extensions 56 and 58 and the thumb or thumbs are positioned at the plate fold line 60 on the outer surface of the plate. By pressing inwardly on the plate fold line 60 while separating extensions 56 and 58 the fitting plate may be opened to a substantially vertical planar configuration as shown in FIG. 4. Next, while maintaining pressure on the fitting plate 46 such that it is in the open, planar configuration the air supply nozzle 38 is inserted into the fitting plate central opening 54 until a snug sealed fit between the plate 46 and the nozzle 38 is obtained as in FIG. 4. Of course, the size of the nozzle 38 and opening 54 are such that the nozzle will tightly wedge into the opening 54 to form an effective seal. Conditioned air may now be supplied to the nozzle which will inflate the blanket and cause the air within the blanket 10 to be exhausted through the blanket orifices 20 in the blanket bottom. By bathing the patient in a constant, gentle flow of air the desired body temperature effect may be achieved without the tissue damage or discomfort

often caused by indirect or direct contact with a heat exchanging member.

It is appreciated that various modifications to the inventive concepts may be apparent to those skilled in the art without departing from the scope of the invention.

Claims

1. A pneumatic, temperature control blanket (10) receiving conditioned air through an external air supply connection means (46), comprising, in combination, an upper flexible sheet (12) and a lower flexible sheet (14) each having a first end (34,36), an opposing second end and edges (32) defining a periphery (28), said first end (36) of the lower flexible sheet (14) being adjacent said first end (34) of the upper flexible sheet (12), a peripheral bonding means bonding said upper flexible sheet (12) periphery to said lower flexible sheet (14) periphery, a pneumatic flow chamber (26) defined by said sheets having walls, an inlet air port (42) defined in said pneumatic flow chamber (26), an inlet air connection means (46) affixed to said sheets in communication with said inlet air port (42) adapted to receive the inlet air supply connection means (38) to inflate said pneumatic flow chamber (26), an outer fibrous bottom lamina material (16) bonded to said lower flexible sheet (14) thereby comprising a laminated assembly (18) to provide a slide resistant comfortable patient contact surface (22), an outwardly disposed air flow orifice (20) array defined in said laminated assembly (18) in communication with said pneumatic flow chamber (26) to convey temperature controlled air from said pneumatic flow chamber (26) to the patient, said orifice (20) array comprising a plurality of openings (20) sized to maintain pneumatic flow chamber pressure over a range of air source volume flow rates, characterized in that said blanket is disposable and in that said inlet connection means (46) comprises an articulating fitting plate having a folded mode and an unfolded inflation mode, an opening (54) defined in said fitting plate in communication with said port (42) adapted to sealingly receive the air supply connection means (38) when said plate is in said unfolded mode, said fitting plate being attached to said upper flexible sheet first end (34) and said lower flexible sheet first end (36), said inlet air port (42) and fitting plate (46) being located intermediate said upper (12) and lower (14) flexible sheets at said sheet's edges to permit the introduction of supply air in said chamber in the direction of the plane of the blanket minimizing flow restrictions.
2. A pneumatic, disposable, temperature control blanket (10) as in claim 1, wherein said upper flexible sheet (12) is impervious to the passage of air thereby increasing the air volume flow rate through said orifice (20) array.
3. A pneumatic, disposable, temperature control blanket (10) as in claim 1 or 2, wherein said orifice array orifices (20) are selectively sized to regulate the air flow impinging on the patient.
4. A pneumatic, disposable, temperature control blanket (10) as in claim 1, 2 or 3, wherein said upper flexible sheet (12) is bonded to said lower flexible sheet (14) at a multitude of staking points (30) distributed in a staggered pattern within said sheets' peripheral edges (28) thereby defining redundant multiple air flow paths (24) within said pneumatic chamber whereby orifice flow rates are maintained during periods of blanket compression, and further comprising bonding means bonding said flexible sheets at said staking points.
5. A pneumatic, disposable, temperature control blanket (10) as in any one of the preceding claims, wherein said fibrous bottom material (16) is a non-woven material.
6. A pneumatic, disposable, temperature control blanket (10) as in claim 5, wherein said fibrous bottom material (16) is non-woven wood pulp airlaid material.
7. A pneumatic temperature control blanket (10) for receiving conditioned air through an external air supply nozzle (38), comprising, in combination, a substantially planar chamber having a flexible upper wall (12), a flexible lower wall (14) and an edge (32), a port (42) communicating with said chamber defined in said edge, characterized in that said blanket is disposable and in that said blanket further comprises a folding fitting plate (46) affixed to said upper (12) and lower (14) walls having a central opening (54) in communication with said port (42), said fitting plate (46) having a fold line (60) in alignment with said chamber edge (32), said fitting plate central opening (54) adapted to slidingly, sealingly receive the air supply nozzle (38) in the blanket plane upon said plate (46) being unfolded, an orifice (20) array defined in said lower chamber wall, said orifices (20) being in communication with said chamber outwardly disposed to discharge chamber air onto the patient.
8. A pneumatic, disposable, temperature control blanket (10) as in claim 7, wherein said fitting plate (46) comprises an elongated member having a first end (48) defining a first end extension (56), a second end (50) defining a second end extension (58) and a circular portion (52) intermediate said first and second ends, said circular portion (52) having a central opening (54) defined therein in alignment with said port (42), adapted to receive the air supply nozzle (38).

9. A pneumatic, disposable, temperature control blanket (10) as in claim 8, wherein said fitting plate circular portion (52) only is sealingly bonded to said flexible upper wall (12) and said flexible lower wall (14) at said blanket edge (32) thereby leaving said plate extensions (56,58) free to move relative said blanket, said circular portion central opening (54) being adapted to align and communicate with said port (42).
10. A pneumatic, disposable, temperature control blanket (10) as in claim 7, 8 or 9, wherein said fitting plate (46) is fabricated of a flexible, foldable material with an outer surface adapted to receive indicia thereon.
11. A pneumatic, disposable, temperature control blanket (10) as in claim 10, further comprising indicia located on said fitting plate (46) outer surface for explanatory and orientation purposes.
12. A pneumatic, disposable, temperature control blanket (10) as in claim 10 or 11, wherein said fitting plate material is cardboard.

Patentansprüche

1. Pneumatische Temperaturkontrolldecke (10), die durch ein äußeres Luftzufuhrverbindungsmittel (38) konditionierte Luft erhält, und die in Kombination folgendes umfaßt: eine obere flexible Fläche (12) und eine untere flexible Fläche (14), die jeweils ein erstes Ende (34,36), ein gegenüberliegendes zweites Ende und Kanten (32) umfassen, die einem Umfang (28) bilden, wobei das erste Ende (36) der unteren flexiblen Fläche (14) nahe bei dem ersten Ende (34) der oberen flexiblen Fläche (12) liegt, ein umfangsseitiges Verbundmittel, das den Umfang der oberen flexiblen Fläche (12) mit dem Umfang der unteren flexiblen Fläche (14) verbindet, eine von den Flächen gebildete pneumatische Strömungskammer (26) mit Wänden, einen Lufteinlaß (42), der in der pneumatischen Strömungskammer (26) ausgebildet ist, ein Lufteinlaßverbindungsmittel (46), das an den Flächen so befestigt ist, daß es mit dem Lufteinlaß (42) in Verbindung steht, und das so ausgelegt ist, daß es das Luftzufuhrverbindungsmittel (38) aufnehmen kann, um die pneumatische Strömungskammer (26) aufblasen zu können, ein äußeres faseriges dünnschichtiges Unterseitenmaterial (16), das mit der unteren flexiblen Fläche (14) verbunden ist, die dadurch einen Schichtaufbau (18) umfaßt, um eine gleitfeste bequeme Patientenkontakfläche (22) vorzusehen, eine nach außen führend angeordnete Gruppe von Luftströmungsöffnungen (20), die in dem Schichtaufbau (18) ausgebildet ist und mit der pneumatischen Strömungskammer (26) in Verbindung steht, um die temperaturgeregelte Luft von der pneumatischen Strömungskammer (26) zu dem Patienten zu beför-

dern, wobei die Gruppe von Öffnungen (20) eine Vielzahl von Öffnungen (20) umfaßt, die größtmäßig so ausgelegt sind, daß der pneumatische Strömungskammerdruck in einem Bereich von Luftquellen-Volumendurchflüssen aufrechterhalten wird, dadurch gekennzeichnet, daß die Decke wegwerfbar ist, und daß das Einlaßverbindungsmittel (46) eine gelenkige Anschlußplatte mit einem gefalteten Modus und einem entfalteten Aufblasmodus umfaßt, daß eine Öffnung (54) in der Anschlußplatte so ausgebildet ist, daß sie mit der Öffnung (42) in Verbindung steht, und so ausgelegt ist, daß sie das Luftzufuhrverbindungsmittel (38) abdichtend aufnimmt, wenn sich die Platte in dem entfalteten Zustand befindet, wobei die Anschlußplatte an dem ersten Ende (34) der oberen flexiblen Fläche und an dem ersten Ende (36) der unteren flexiblen Fläche angebracht ist, wobei der Lufteinlaß (42) und die Anschlußplatte (46) zwischen den oberen (12) und unteren (14) flexiblen Flächen an den Kanten der Flächen angeordnet ist, um das Einführen von zugeführter Luft in die Kammer in der Richtung der Ebene der Decke zu erlauben, wodurch Strömungsbeschränkungen auf ein Minimum herabgesetzt werden.

2. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 1, bei der die obere flexible Fläche (12) undurchlässig für den Durchgang von Luft ist, wodurch der Luftvolumendurchfluß durch die Gruppe von Öffnungen (20) vergrößert wird.
3. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 1 oder 2, bei der die Öffnungsgruppenöffnungen (20) wahlweise größtmäßig bemessen werden, um die Luftströmung zu regulieren, die auf den Patienten auftrifft.
4. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 1, 2 oder 3, bei der die obere flexible Fläche (12) mit der unteren flexiblen Fläche (14) an einer Vielzahl von Verbindungspunkten (30) verbunden ist, die in einem Zickzackmuster innerhalb der Umfangskanten (28) der Flächen verteilt sind, wodurch überreichlich viele Luftströmungswege (24) in der pneumatischen Kammer gebildet werden, wodurch Öffnungsdurchflüsse während der Zeiträume des Zusammendrückens der Decke aufrechterhalten werden, und die außerdem Verbundmittel umfaßt, die die flexiblen Flächen an den Verbindungspunkten verbinden.
5. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach einem der vorhergehenden Ansprüche, bei der das

- faserige Unterseitenmaterial (16) ein Vliesmaterial ist.
6. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 5, bei der das faserige Unterseitenmaterial (16) ein im Luftstrom aufgebrachtes, nichtgewebtes Zellstoffmaterial ist. 5
 7. Pneumatische Temperaturkontrolldecke (10) zur Aufnahme von konditionierter Luft durch eine äußere Luftzufuhrdüse (38), die in Kombination folgendes umfaßt: eine im wesentlichen ebene Kammer mit einer flexiblen oberen Wand (12), einer flexiblen unteren Wand (14) und einer Kante (32), einen Anschluß (42), der mit der Kammer in Verbindung steht und in der Kante ausgebildet ist, dadurch gekennzeichnet, daß die Decke wegwerfbar ist, und daß die Decke außerdem eine Faltanschlußplatte (46) umfaßt, die an den oberen (12) und unteren (14) Wänden befestigt ist und eine zentrale Öffnung (54) aufweist, die in Verbindung mit dem Anschluß (42) steht, wobei die Anschlußplatte (46) eine Faltlinie (60) aufweist, die auf die Kammerkante (32) ausgerichtet ist, wobei die zentrale Öffnung (54) der Anschlußplatte so ausgelegt ist, daß sie die Luftzufuhrdüse (38) in der Deckenebene auf der entfalteten Platte (46) gleitend und abdichtend aufnehmen kann, wobei eine Gruppe von Öffnungen (20) in der unteren Kammerwand ausgebildet ist und die Öffnungen (20) in Verbindung mit der Kammer stehen und nach außen gerichtet angeordnet sind, um die Kammerluft an den Patienten abzugeben. 10 15 20 25 30
 8. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 7, bei der die Anschlußplatte (46) ein längliches Element mit einem ersten Ende (48), das eine erste Endverlängerung (56) bildet, einem zweiten Ende (50), das eine zweite Endverlängerung (58) bildet, und einem kreisrunden Abschnitt (52) zwischen den ersten und zweiten Enden umfaßt, wobei der kreisrunde Abschnitt (52) eine darin ausgebildete und auf den Anschluß (42) ausgerichtete zentrale Öffnung (54) aufweist, die so ausgelegt ist, daß sie die Luftzufuhrdüse (38) aufnehmen kann. 35 40 45
 9. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 8, bei der der kreisrunde Abschnitt (52) der Anschlußplatte nur abdichtend mit der flexiblen oberen Wand (12) und der flexiblen unteren Wand (14) an der Deckenkante (32) verbunden ist, so daß sich die Plattenverlängerungen (56, 58) relativ zu der Decke frei bewegen können, wobei die zentrale Öffnung (54) des kreisrunden Abschnitts so ausgelegt ist, daß sie auf den Anschluß (42) ausgerichtet werden und mit diesem in Verbindung stehen kann. 50 55

10. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 7, 8 oder 9, bei der die Anschlußplatte (46) aus einem flexiblen, faltbaren Material mit einer Außenfläche hergestellt wird, die so ausgelegt ist, daß sie Angaben darauf aufnehmen kann.
11. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 10, desweiteren mit Angaben, die sich auf der Außenseite der Anschlußplatte (46) zu Erläuterungs- und Orientierungszwecken befinden.
12. Pneumatische, zum einmaligen Gebrauch bestimmte Temperaturkontrolldecke (10) nach Anspruch 10 oder 11, bei der das Anschlußplattenmaterial Pappe ist.

Revendications

1. Couverture à contrôle de température, pneumatique, (10), recevant de l'air conditionné par l'intermédiaire d'un moyen de connexion d'alimentation en air extérieur (46), comportant, en combinaison, une feuille souple supérieure (12) et une feuille souple inférieure (14) possédant chacune une première extrémité (34, 36), une seconde extrémité opposée et des bords (32) définissant une périphérie (28), ladite première extrémité (36) de la feuille souple inférieure (14) étant adjacente à ladite première extrémité (34) de la feuille souple supérieure (12), un moyen de liaison périphérique reliant ladite périphérie de la feuille souple supérieure (12) à la périphérie de ladite feuille souple inférieure (14), une chambre d'écoulement pneumatique (26) délimitée par lesdites feuilles possédant des parois, un orifice d'admission d'air (42) ménagé dans ladite chambre d'écoulement pneumatique (26), un moyen de connexion d'air d'admission (46) fixé auxdites feuilles en communication avec ledit orifice d'admission d'air (42) apte à recevoir le moyen de connexion d'alimentation d'air d'admission (38) pour gonfler ladite chambre d'écoulement pneumatique (26), un matériau stratifié inférieur fibreux extérieur (16) relié à ladite feuille souple inférieure (14) formant ainsi un ensemble stratifié (18) pour constituer une surface de contact (22) confortable pour le malade, résistant au glissement, un ensemble d'orifices d'écoulement d'air (20) disposé extérieurement, ménagé dans ledit ensemble stratifié (18) en communication avec ladite chambre d'écoulement pneumatique (26) pour acheminer de l'air à température contrôlée depuis ladite chambre d'écoulement pneumatique (26) vers le malade, ledit ensemble d'orifices (20) comportant une pluralité d'ouvertures (20) dimensionnées pour maintenir la pression de la chambre d'écoulement pneumatique dans une plage de débits de volume de source d'air, caractérisée en ce que ladite couverture est jetable et en ce que ledit

- moyen de connexion d'admission (46) comporte une plaque de montage articulée présentant un mode plié et un mode de gonflage non plié, une ouverture (54) pratiquée dans ladite plaque de montage en communication avec ledit orifice (42) adaptée pour recevoir de façon hermétique le moyen de connexion d'alimentation en air (38) lorsque ladite plaque se trouve dans ledit mode non plié, ladite plaque de montage étant fixée à ladite première extrémité de la feuille souple supérieure (34) et à ladite première extrémité de la feuille souple inférieure (36), ledit orifice d'admission d'air (42) et la plaque de montage (46) étant situés entre lesdites feuilles souples supérieure (12) et inférieure (14) sur lesdits bords des feuilles pour permettre l'introduction d'air d'alimentation dans ladite chambre dans la direction du plan de la couverture rendant minimales des limitations d'écoulement.
2. Couverture à contrôle de température (10) jetable, pneumatique, selon la revendication 1, dans laquelle ladite feuille flexible supérieure (12) est imperméable à l'air, augmentant ainsi le débit de volume d'air à travers ledit ensemble d'orifices (20).
 3. Couverture à contrôle de température (10) jetable, pneumatique, selon la revendication 1 ou 2, dans laquelle lesdits orifices (20) de l'ensemble d'orifices sont sélectivement dimensionnés pour réguler l'écoulement d'air frappant le malade.
 4. Couverture à contrôle de température (10) jetable, pneumatique, selon les revendications 1, 2 ou 3, dans laquelle ladite feuille souple supérieure (12) est reliée à ladite feuille souple inférieure (14) en une multitude de points de fixation (30) répartis de façon échelonnée à l'intérieur des bords périphériques desdites feuilles (28) définissant ainsi des trajets d'écoulement d'air multiples redondants (24) à l'intérieur de ladite chambre pneumatique, de telle sorte que les débits d'orifices soient maintenus durant des périodes de compression de la couverture, et comportant en outre des moyens de liaison reliant lesdites feuilles souples auxdits points de fixation.
 5. Couverture à contrôle de température (10) jetable, pneumatique, selon l'une quelconque des revendications précédentes, dans laquelle ledit matériau inférieur fibreux (16) est un matériau non tissé.
 6. Couverture à contrôle de température (10) jetable, pneumatique, selon la revendication 5, dans laquelle ledit matériau inférieur fibreux (16) est un matériau à coussin d'air en pulpe de bois non tissé.
 7. Couverture à contrôle de température, pneumatique, (10) pour recevoir de l'air conditionné par l'intermédiaire d'une buse d'alimentation en air extérieur (38), comportant, en combinaison, une chambre

sensiblement planaire ayant une paroi supérieure souple (12), une paroi inférieure souple (14) et un bord (32), un orifice (42) communiquant avec ladite chambre délimitée par ledit bord, caractérisée en ce que ladite couverture est jetable et en ce que ladite couverture comporte en outre une plaque de montage pliante (46) fixée auxdites parois supérieure (12) et inférieure (14) ayant une ouverture centrale (54) en communication avec ledit orifice (42), ladite plaque de montage (46) ayant une ligne de pliage (60) en alignement avec ledit bord (32) de la chambre, ladite ouverture centrale (54) de la plaque de montage pouvant recevoir à coulissement, de façon hermétique la buse d'alimentation en air (38) dans le plan de la couverture sur ladite plaque (46) dépliée, un ensemble d'orifices (20) pratiqués dans ladite paroi de chambre inférieure, lesdits orifices (20) étant en communication avec ladite chambre disposés extérieurement pour déverser l'air de la chambre sur le malade.

8. Couverture à contrôle de température (10), jetable, pneumatique, selon la revendication 7, dans laquelle ladite plaque de montage (46) comporte un élément allongé possédant une première extrémité (48) définissant un premier prolongement terminal (56), une seconde extrémité (50) définissant un second prolongement terminal (58) et une partie circulaire (52) entre lesdites première et seconde extrémités, ladite partie circulaire (52) ayant une ouverture centrale (54) pratiquée dans celle-ci en alignement avec ledit orifice (42), destinée à recevoir la buse d'alimentation en air (38).
9. Couverture à contrôle de température (10), jetable, pneumatique, selon la revendication 8, dans laquelle seule ladite partie circulaire (52) de la plaque de montage est reliée de façon hermétique à ladite paroi supérieure souple (12) et à ladite paroi inférieure souple (14) sur ledit bord (32) de la couverture, laissant ainsi lesdits prolongements (56, 58) de la plaque libres de se déplacer par rapport à ladite couverture, ladite ouverture centrale (54) de la partie circulaire pouvant s'aligner sur et communiquer avec ledit orifice (42).
10. Couverture à contrôle de température (10), jetable, pneumatique, selon la revendication 7, 8 ou 9, dans laquelle ladite plaque de montage (46) est réalisée en un matériau pliable souple avec une surface extérieure apte à recevoir des marquages.
11. Couverture à contrôle de température (10), jetable, pneumatique, selon la revendication 10, comportant en outre des marquages situés sur la surface extérieure de ladite plaque de montage (46) à des fins d'explication et d'orientation.

12. Couverture à contrôle de température (10), jetable, pneumatique, selon la revendication 10 ou 11, dans laquelle le matériau de ladite plaque de montage est du carton.

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